

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau



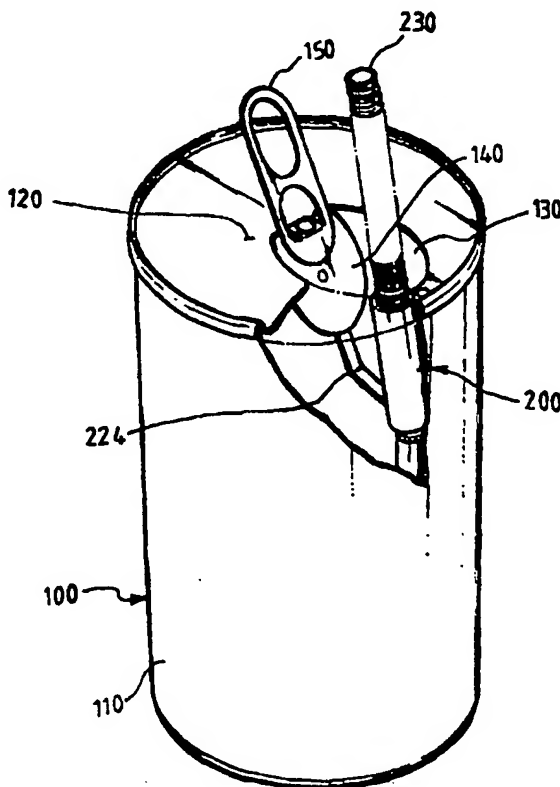
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification<sup>6</sup> : B65D 25/10, A47G 21/18</p>	<p>A1</p>	<p>(11) International Publication Number: WO 98/56669 (43) International Publication Date: 17 December 1998 (17.12.98)</p>
<p>(21) International Application Number: PCT/KR98/00154 (22) International Filing Date: 11 June 1998 (11.06.98) (30) Priority Data: 1997/14065 12 June 1997 (12.06.97) KR 1998/18686 23 May 1998 (23.05.98) KR (71)(72) Applicant and Inventor: KIM, Il, Hee [KR/KR]; #513-203, Jukong Apt., 961, Sunbu-dong, Ansan-shi 425-140 (KR). (74) Agent: KIM, Suk, Hwan; #201, Hwain Building, 824-29 Yoksam-dong, Kangnam-ku, Seoul 135-080 (KR).</p>		<p>(81) Designated States: BR, CN, DE, GB, JP, US.  Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</p>

(54) Title: DEVICE FOR TAKING OUT A STRAW FOR A BEVERAGE CAN

(57) Abstract

By lifting the other end of a grip (15), one end of the grip presses down a can lid portion (14), and a can opening (13) is formed in a can upper wall while a score line delimiting the can lid portion is torn. The can lid portion (14) is moved into the beverage can, an edge of the can lid portion, which is opposed to the other end of the grip is moved and contacted to a connection piece (223) thereby bending the connection piece along its score line (224). Accordingly, the continuously moving can lid portion pulls the connection piece (223) toward the center of the beverage can, and a rotating member (220) integrally connected to the connection piece is rotated about the line connecting the centers of a pair of projections (222). As the rotating member (220) is rotated, an upper end of the rotating member is moved toward the can opening, and a bellows part of a straw, which is prevented from upward expanding, projects through the can opening and beyond the can upper wall. Therefore, it is possible to drink beverage through the projected straw.



*FOR THE PURPOSES OF INFORMATION ONLY*

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Larvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon	KR	Republic of Korea	PL	Poland		
CN	China	KZ	Kazakstan	PT	Portugal		
CU	Cuba	LC	Saint Lucia	RO	Romania		
CZ	Czech Republic	LI	Liechtenstein	RU	Russian Federation		
DE	Germany	LK	Sri Lanka	SD	Sudan		
DK	Denmark	LR	Liberia	SE	Sweden		
EE	Estonia			SG	Singapore		

## DEVICE FOR TAKING OUT A STRAW FOR A BEVERAGE CAN

Technical Field

The present invention relates to a device for taking  
5 out a straw for a beverage can, and more particularly to a  
device for taking a straw for a beverage can, by which  
a straw compressively received in a beverage can may be  
automatically projected through a can opening and beyond a  
can upper wall while a can lid portion formed when a  
10 beverage can is opened is moved downward or upward into or  
out of the beverage can, whereby it is possible to  
conveniently and hygienically drink beverage.

Background Art

15 Referring to FIG. 1, there is illustrated a partially  
broken perspective view which shows a structure of a  
beverage can of the prior art. A beverage can 10 is  
generally made from aluminum. The beverage can 10 includes  
a can side wall 11 having substantially a cylindrical  
20 configuration, and a can upper wall 12 and a can bottom  
wall which close an upper end and a lower end of the  
cylindrical side wall 11, respectively. The can upper wall  
12 is provided with a grip 15 which is secured to the can  
upper wall 12 by using an appropriate technique well known  
25 in the art, such as rivetting. Below one end of the grip  
15, the can upper wall 12 is formed with a score line which  
delimits a can lid portion 14. By lifting the other end of  
the grip 15, the one end of the grip 15 presses down the

can lid portion 14 encompassed by the score line, then the score line is torn, and the can lid portion 14 is moved into the beverage can 10 to define a can opening 13 in the can upper wall 12; whereby it is possible to drink beverage 5 through the can opening 13.

However, in the beverage can of the prior art, constructed as mentioned above, since one's lip must be put onto the can upper wall defining the can opening, hygiene cannot be ensured. In other words, since foreign material 10 such as dust, etc. is adhered onto the can upper wall, it is necessary to remove the foreign material such as dust, etc. before opening the beverage can. However, although it is possible to locate a tissue, etc. when drinking the beverage can in office or home, it is difficult to locate 15 the tissue, etc. when drinking the beverage can in the fields. Accordingly, in the latter case, since the foreign material such as dust, etc. is eliminated using handkerchief or clothes, etc., hygiene cannot be ensured. Also, since one's lip must be put onto the can upper wall 20 defining the can opening to drink beverage, beverage is apt to run down out of the beverage can even with minor inadvertence, thereby to soil clothes.

In order to hygienically drink beverage, it is usual practice to drink beverage through a portion of a straw 25 which is projected upward beyond the can upper wall in a state that the straw is inserted through the can opening into the beverage can. However, in this case, it is inconvenient to prepare a separate straw. Also, when the

straw is used, since it is needed to grasp the beverage can with one hand and the straw with the other hand, the use thereof is very troublesome.

5 Disclosure of Invention

Accordingly, the present invention has been made in an effort to solve the problems occurring in the prior art, and an object of the present invention is to provide a device for taking out a straw for a beverage can, by which  
10 a straw compressively received in a beverage can may be automatically projected through a can opening and beyond a can upper wall while a can lid portion formed when a beverage can is opened is moved downward or upward into or out of the beverage can, whereby it is possible to  
15 conveniently and hygienically drink beverage.

According to one aspect of the present invention, there is provided a device for taking out a straw for a beverage can, comprising: a rotating member rotatably secured to a can upper wall or a can side wall in the  
20 beverage can and defining an inner space into which the straw can be inserted, the rotating member being rotated by a can lid portion formed when the beverage can is opened, to project the straw upward through a can opening and beyond the can upper wall.

25 According to another aspect of the present invention, the device further comprises: a fixed member having an upper end secured to the can upper wall in the beverage can and a lower end to which the rotating member is rotatably

secured.

According to another aspect of the present invention, the rotating member has a cylindrical configuration, a portion of the rotating member is cut in a longitudinal  
5 direction and bent to define a connection piece which extends slantingly toward the can upper wall, and an upper end of the connecting piece is secured to the can upper wall.

According to another aspect of the present invention,  
10 substantially a middle portion of the connection piece is formed with a score line, an edge of the can lid portion moving into the beverage can when the beverage can is opened is contacted to the middle portion to bend the connection piece along the score line, and the rotating  
15 member is rotated while the can lid portion is continuously moved into the beverage can after bending the connection piece.

According to another aspect of the present invention, the straw has a bellows part and a straight part, the  
20 bellows part being compressively received in the inner space of the rotating member and the straight part extending from a lower end of the rotating member toward a can bottom wall.

According to another aspect of the present invention,  
25 the straw comprises a vinyl tube and a coil spring wound around a circumferential inner or outer surface of the vinyl tube.

According to another aspect of the present invention,

the fixed member has a semicircular cross-section, the rotating member is fitted into the fixed member, and the upper end of the fixed member is formed with a barrier piece for blocking upward expansion of the straw.

5       Also, according to still another aspect of the present invention, there is provided a device for taking out a straw for a beverage can, comprising: a plate-shaped straw take-out member having one end defining an inner space into which the straw can be inserted and formed with an engaging  
10 piece, the other end formed with a stepped portion into which the engaging piece can be engaged, and a middle portion bent such that a degree is defined between the ends.

According to yet still another aspect of the present  
15 invention, the straw take-out member comprises a pair of elastic plates integrally connected with each other, the pair of elastic plates being contacted with each other and positioned into a side by side relationship when the engaging piece is engaged into the stepped portion, and a  
20 can lid portion being formed when the beverage can is opened disengages the engaging piece from the stepped portion while it is moved into the beverage can.

By the features of the present invention, due to the fact that a straw compressively received in a beverage can  
25 may be automatically projected through a can opening and beyond a can upper wall while a can lid portion formed when a beverage can is opened is moved downward or upward into or out of the beverage can, it is not needed to prepare a

separate straw and to grasp the straw with a hand while drinking beverage using the straw, whereby convenience is ensured. Also, since a disinfected straw is contained in the beverage can such that it is projected outside to be  
5 conveniently used, it is not needed to put one's lip onto a can upper wall defining a can opening, whereby hygiene is ensured.

#### Brief Description of Drawings

10 The above objects, and other features and advantages of the present invention will become more apparent after a reading of the following detailed description taken in conjunction with the drawings, in which:

FIG. 1 is a partially broken perspective view  
15 illustrating a structure of a beverage can of the prior art;

FIG. 2 is a partially broken perspective view illustrating a state in which a beverage can having installed therein a device for taking out a straw in  
20 accordance with an embodiment of the present invention is opened;

FIG. 3 is an exploded perspective view of the device for taking out a straw according to the present invention;

FIG. 4 is a partial cross-sectional view illustrating  
25 a state in which the device for taking out a straw of FIG. 3 is installed into the beverage can;

FIG. 5 is a partial cross-sectional view illustrating a state in which the beverage can is opened to project a



straw upward beyond a can upper wall;

FIG. 6 is a partially broken front view showing another straw in accordance with another embodiment of the present invention;

5        FIG. 7 is a perspective view illustrating an independent appearance of a device for taking out a straw in accordance with still another embodiment of the present invention;

FIG. 8 is a partially broken perspective view  
10 illustrating a state in which a beverage can having installed therein the device for taking out a straw of FIG. 7 is opened;

FIG. 9 is a partial sectional plan view for explaining a structure by which the straw is taken out by the device  
15 of FIG. 7; and

FIG. 10 is a partial cross-sectional view for explaining a structure by which the straw is taken out in accordance with yet still another embodiment of the present invention.

20

#### Best Mode for Carrying out the Invention

Reference will now be made in greater detail to a preferred embodiment of the invention, an example of which is illustrated in the accompanying drawings. Wherever  
25 possible, the same reference numerals will be used throughout the drawings to refer to the same or like parts.

Referring to FIGs. 2 through 6, a beverage can 100 is generally made from aluminum. The beverage can 100

includes a can side wall 110 having substantially a cylindrical configuration, and a can upper wall 120 and a can bottom wall which close an upper end and a lower end of the cylindrical side wall 110, respectively. The can upper  
5 wall 120 is provided with a grip 150 which is secured to the can upper wall 120 by using an appropriate technique well known in the art, such as rivetting. Below one end of the grip 150, the can upper wall 120 is formed with a score line which delimits a can lid portion 140. By lifting the  
10 other end of the grip 150, the one end of the grip 150 presses down the can lid portion 140 encompassed by the score line, then the score line is torn, and the can lid portion 140 is moved into the beverage can 100 to define a can opening 130 in the can upper wall 120, whereby it is  
15 possible to drink beverage through the can opening 130.

A device 200 for taking out a straw is provided in the beverage can 100 and includes a fixed member 210 and a rotating member 220.

The fixed member 210, as best shown in FIG. 3, extends  
20 in the longitudinal direction and has a semicircular cross-section. An upper end of the fixed member 210 is integrally formed with a barrier piece 211 such that it blocks the semicircular cross-section of the fixed member 210. An inner surface of a lower end of the fixed member  
25 210 is formed with a pair of projections 213 such that they are opposed to each other. The barrier piece 211 is secured to a lower surface of the can upper wall 120 by using an appropriate fastening means, by which the fixed

member 210 is firmly secured to the can upper wall 120.

The rotating member 220, as best shown in FIG. 3, has substantially a cylindrical configuration, and a portion of the rotating member 220 is cut in the longitudinal  
5 direction and bent in its lower end to define a connection piece 223. The connection piece 223 extends slantingly toward the can upper wall 120, and an upper end of the connection piece 223 is bent again to define a flat  
10 portion. The flat portion is secured to a lower surface of the can lid portion 140 by using an appropriate fastening means known in the art. Substantially a middle portion of the connection piece 223 is formed with a score line 224, and thereby the connection piece 223 can be easily bent along the score line 224.

15 The rotating member 220 is received in a semicircular recess of the fixed member 210, and an outer surface of a lower end of the rotating member 220 is formed with a pair of inserting grooves 222 such that they are opposed to each other. By the fact that the pair of projections 213 formed  
20 in the fixed member 210 is inserted into the pair of inserting grooves 222, respectively, the rotating member 220 can be rotated about a line connecting the centers of the pair of projections 213. The rotating member 220 functions to support a straw 230, and in a preferred  
25 embodiment of the present invention, the straw 230 has a bellows part and a straight part. The bellows part of the straw 230 is compressively received in the cylindrical rotating member 220, and the straight part of the straw 230

extends downward from the lower end of the rotating member 220 toward the can bottom wall. For this, the lower end of the cylindrical rotating member 220 may be formed with an inward flange and the straight part may have a diameter less than the bellows part. Due to the fact that an upper end of the bellows part contacts to a lower surface of the barrier piece 211 of the fixed member 210, an upward expansion of the bellows part compressively received in the rotating member 220 is prevented.

10 Hereinafter, an operation of the device 200 for taking out a straw in accordance with this embodiment of the present invention will be described in detail:

As shown in FIG. 4, in case that the can lid portion 140 of the beverage can 100 is not opened, the fixed member 210 is firmly secured to the lower surface of the can upper wall 120, and the rotating member 220 is received in the semicircular recess of the fixed member 210. The lower end of the rotating member 220 is rotatably secured to the fixed member 210, and the connection piece 223 of the rotating member 220 is secured at its upper end to the lower surface of the can lid portion 140 while extending slantingly toward the can upper wall 120. The bellows part of the straw 230 is compressively received in the rotating member 220, and the upper end of the bellows part is squeezed against the lower surface of the barrier piece 211 of the fixed member 210.

As shown in FIG. 5, in case that the can lid portion 140 of the beverage can 100 is opened, by lifting the other

end of the grip 150, the one end of the grip 150 presses down the can lid portion 140, and according to this, the can opening 130 is formed in the can upper wall 120 while the score line delimiting the can lid portion 140 is torn.

5 The can lid portion 140 is moved into the beverage can 100, an edge of the can lid portion 140, which is opposed to the other end of the grip 150 is moved and contacted to the connection piece 223 thereby to bend the connection piece 223 along the score line 224. Accordingly, the

10 continuously moving can lid portion 140 pulls the connection piece 223 toward the center of the beverage can 100, and the rotating member 220 integrally connected to the connection member 223 is rotated about the line connecting the centers of the pair of projections 213. As

15 the rotating member 220 is rotated, the upper end of the rotating member 220 is moved toward the can opening 130, and the bellows part of the straw 230, which is prevented from upward expanding, projects through the can opening 130 and beyond the can upper wall 120. Therefore, it is

20 possible to drink beverage through the projected straw 230.

Referring to FIG. 6, there is illustrated a partially broken front view showing another straw in accordance with another embodiment of the present invention.

The straw 230 according to this embodiment of the

25 present invention includes a vinyl tube 231 and a coil spring 232 wound around a circumferential inner or outer surface of the vinyl tube 231. Accordingly, without forming a separate bellows part in a straw, the entire

P22473.A02

September 17, 2002

straw 230 can have a contracting property.

Referring to FIGs. 7 through 9, there is illustrated a device for taking out a straw in accordance with still another embodiment of the present invention. The device for taking out a straw according to this embodiment of the present invention has substantially a hinge-shaped configuration, and has a rotating plate part 250 and a fixed plate part 250a which are integrally formed. An elastic channel part 240 is formed in the region where the rotating plate part 250 and the fixed plate part 250a are connected to each other, to facilitate the rotation of the rotating plate part 250.

Adjacent to the elastic channel part 240, a connection piece 241 is formed on an upper end surface of the fixed plate part 250a such that it extends in a horizontal direction. The connection piece 241 is secured to the can upper wall 120 by using an appropriate fastening means known in the art. A portion of the fixed plate part 250a adjacent to the connection piece 241 is cut to define an elastic piece 280 which is bent in a direction perpendicular to a plane of the fixed plate part 250a. Substantially a middle portion of the elastic piece 280 is bent to form a stepped portion 281. Between the elastic piece 280 and the free end of the fixed plate part 250a, a barrier piece 290 is formed on the upper end surface of the fixed plate part 250a. The barrier piece 290 horizontally extends in a direction opposed to the direction in which the connection piece 241 extends.

The free end of the rotating plate part 250 is formed with a straw support tube 260 which has substantially a cylindrical configuration and extends in the longitudinal direction. A portion adjacent to an upper end of the straw support tube 260 is cut and bent in a radial direction to form an engaging piece 270. The straw support tube 260 functions to support the straw 230, and in a preferred embodiment of the present invention, the straw 230 has a bellows part and a straight part. The bellows part of the straw 230 is compressively received in the straw support tube 260, and the straight part of the straw 230 extends downward from a lower end of the straw support tube 260 toward the can bottom wall. For this, the lower end of the straw support tube 260 may be formed with an inward flange and the straight part may have a diameter less than the bellows part. Due to the fact that an upper end of the bellows part contacts to a lower surface of the barrier piece 290 of the fixed plate part 250a, upward expansion of the bellows part compressively received in the straw support tube 260 is prevented.

Hereinafter, the operation of the device for taking out a straw according to this embodiment of the present invention, constructed as mentioned above, will be described in detail:

By the fact that the connection piece 241 is secured to the lower surface of the can upper wall 120, the fixed plate part 250a is firmly secured to the can upper wall 120. In case that the can lid portion 140 of the beverage



can 100 is not opened, the engaging piece 270 of the rotating plate 250 is engaged into the stepped portion 281 of the fixed plate part 250a, whereby the rotating plate part 250 is position in a side by side relationship with  
5 the fixed plate part 250a. In case that the can lid portion 140 of the beverage can 100 is opened, by lifting the other end of the grip 150, the one end of the grip 150 presses down the can lid portion 140, and according to this, the can opening 130 is formed in the can upper wall  
10 120 while the score line delimiting the can lid portion 140 is torn. The can lid portion 140 is moved into the beverage can 100, an edge of the can lid portion 140, which is opposed to the other end of the grip 150 is moved and contacted to the elastic piece 280 thereby to disengage the  
15 engaging piece 270 from the stepped portion 281. If the the engaging piece 270 is disengaged from the stepped portion 281, the rotating plate part 250 positioned in the side by side relationship with the fixed plate part 250a is rotated such that a degree is defined between the two plate  
20 parts 250 and 250a. As the rotating plate part 250 is rotated, the straw support tube 260 formed in the free end of the rotating plate part 250 is moved toward the can opening 130, and the bellows part of the straw 230, which is prevented from upward expanding, projects through the  
25 opening 130 and beyond the can upper wall 120. Therefore, it is possible to drink beverage through the projected straw 230.

Referring to FIG. 10, there is illustrated a partial

cross-sectional view for explaining a structure by which the straw is taken out in accordance with yet still another embodiment of the present invention.

In this embodiment of the present invention, a can opening is formed in the can upper wall 120 while a can lid portion 140 formed in the can upper wall 120 of the beverage can 100 is lifted. The device according to this embodiment is the same with that according to the embodiment shown in FIGs. 7 through 9, except that a projecting flange portion 300 is integrally formed in the lower surface of the can lid portion 140. The projecting flange portion 300 disengages the engaging piece 270 from the stepped portion 281 while moving as the can lid portion 140 is lifted.

15

#### Industrial Applicability

As a result, according to the present invention, due to the fact that a straw compressively received in a beverage can may be automatically projected through a can opening and beyond a can upper wall while a can lid portion formed when a beverage can is opened is moved downward or upward into or out of the beverage can, it is not needed to prepare a separate straw and to grasp the straw with a hand while drinking beverage using the straw, whereby convenience is ensured. Also, since a disinfected straw is contained in the beverage can such that it is projected outside to be conveniently used, it is not needed to put one's lip onto a can upper wall defining a can opening,

whereby hygiene is ensured.

In the drawings and specification, there have been disclosed typical preferred embodiments of the invention and, although specific terms are employed, they are used in  
5 a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the following claims.

What is claimed is:

1. A device for taking out a straw for a beverage can, comprising:

a rotating member rotatably secured to a can upper  
5 wall or a can side wall in the beverage can and defining an inner space into which the straw can be inserted, said rotating member being rotated by a can lid portion formed when said beverage can is opened, to project said straw  
upward through a can opening and beyond said can upper  
10 wall.

2. A device for taking out a straw for a beverage can as claimed in Claim 1, further comprising:

a fixed member having an upper end secured to said can  
15 upper wall in said beverage can and a lower end to which said rotating member is rotatably secured.

3. A device for taking out a straw for a beverage can as claimed in Claim 1, wherein said rotating member has  
20 a cylindrical configuration, a portion of said rotating member is cut in a longitudinal direction and bent to define a connection piece which extends slantingly toward said can upper wall, and an upper end of said connecting piece is secured to said can upper wall.

25

4. A device for taking out a straw for a beverage can as claimed in Claims 1 or 3, wherein substantially a middle portion of said connection piece is formed with a

score line, an edge of said can lid portion moving into said beverage can when said beverage can is opened is contacted to said middle portion to bend said connection piece along said score line, and said rotating member is  
5 rotated while said can lid portion is continuously moved into said beverage can after bending said connection piece.

5. A device for taking out a straw for a beverage can as claimed in Claim 1, wherein said straw has a bellows  
10 part and a straight part, said bellows part being compressively received in said inner space of said rotating member and said straight part extending from a lower end of said rotating member toward a can bottom wall.

15 6. A device for taking out a straw for a beverage can as claimed in Claim 1, wherein said straw comprises a vinyl tube and a coil spring wound around a circumferential inner or outer surface of said vinyl tube.

20 7. A device for taking out a straw for a beverage can as claimed in Claim 2, wherein said fixed member has a semicircular cross-section, said rotating member is fitted into said fixed member, and said upper end of said fixed member is formed with a barrier piece for blocking upward  
25 expansion of said straw.

8. A device for taking out a straw for a beverage can, comprising:

a plate-shaped straw take-out member having one end defining an inner space into which the straw can be inserted and formed with an engaging piece, the other end formed with a stepped portion into which said engaging  
5 piece can be engaged, and a middle portion bent such that a degree is defined between said ends.

9. A device for taking out a straw for a beverage can as claimed in Claim 8, wherein said straw take-out  
10 member comprises a pair of elastic plates integrally connected with each other, said pair of elastic plates being contacted with each other and positioned into a side by side relationship when said engaging piece is engaged into said stepped portion, and a can lid portion being  
15 formed when the beverage can is opened disengages said engaging piece from said stepped portion while it is moved into said beverage can.

FIG. 1

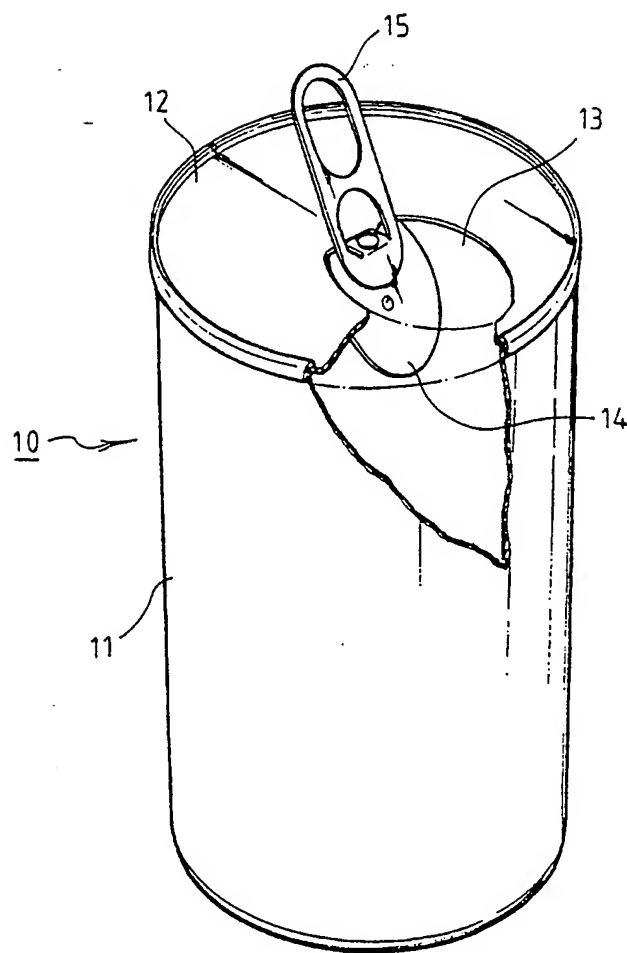
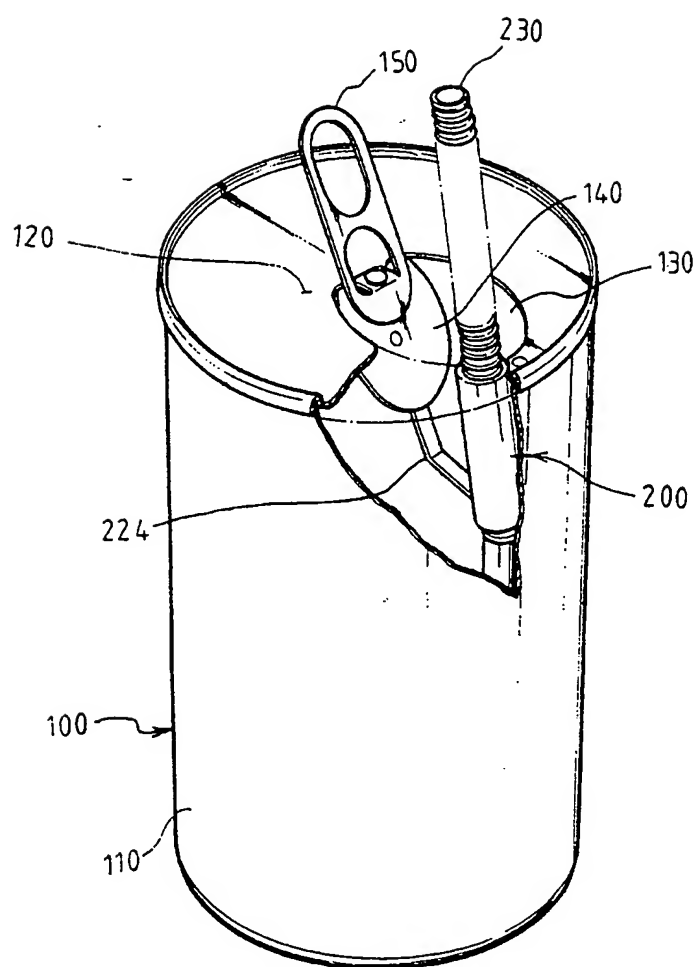


FIG. 2





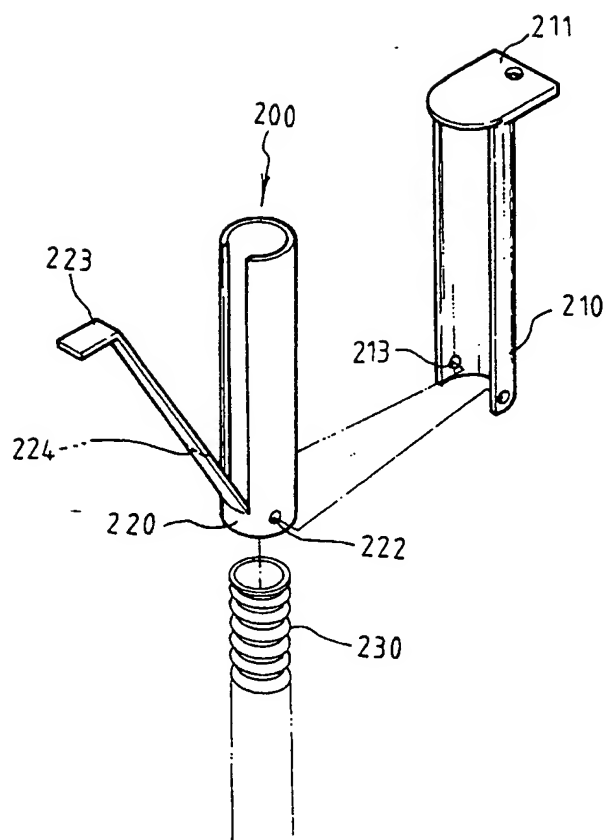
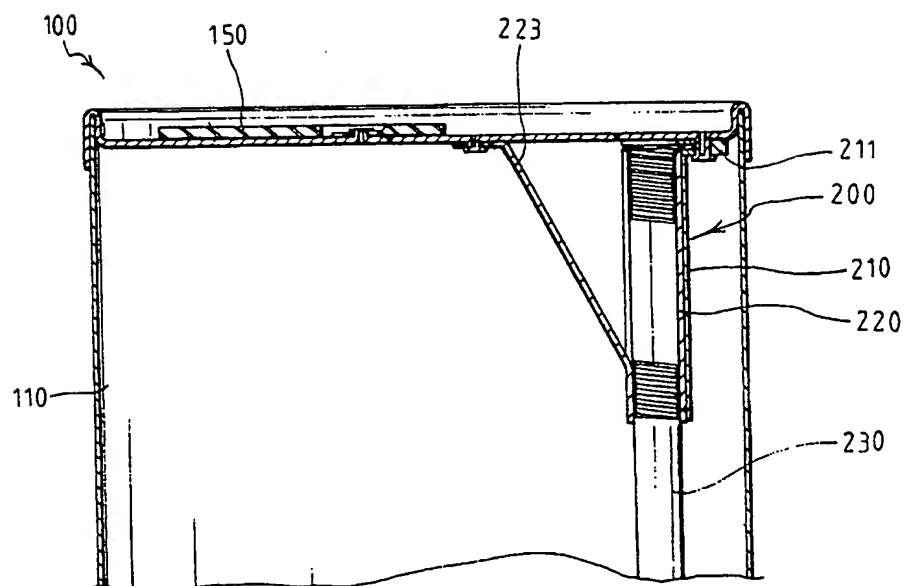
3 / 7  
FIG. 3

FIG. 4



4 / 7

FIG. 5

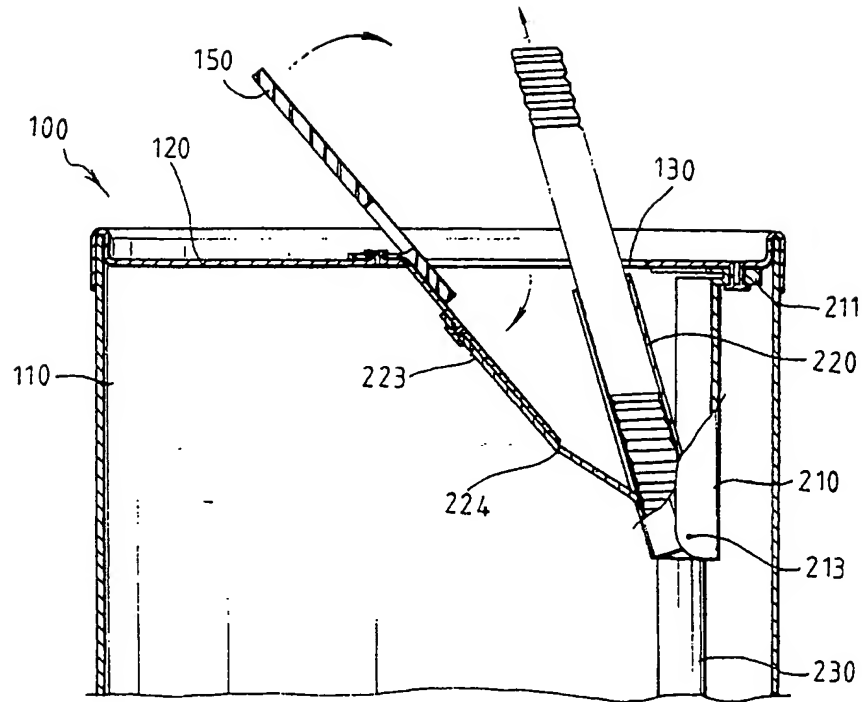


FIG. 6

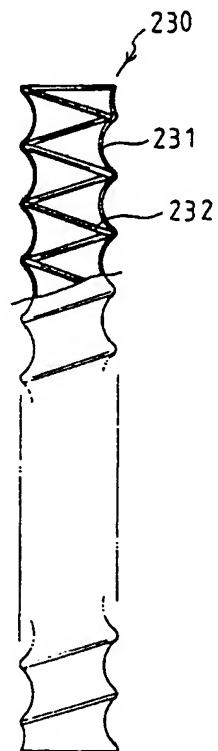
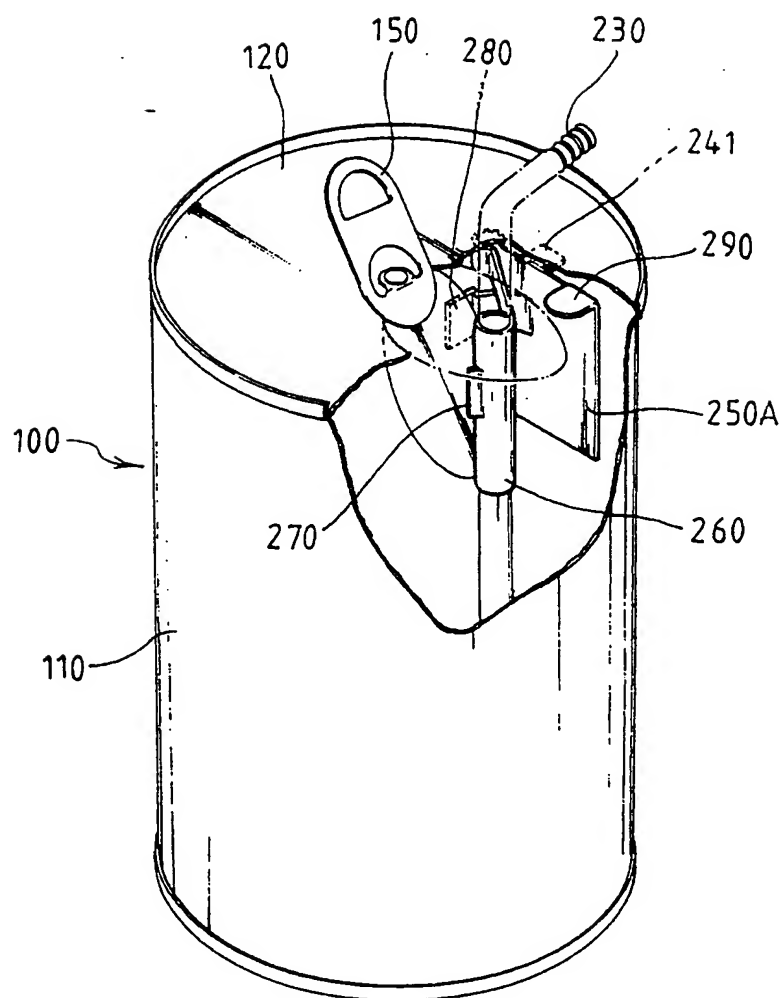




FIG. 8



7 / 7

FIG. 9

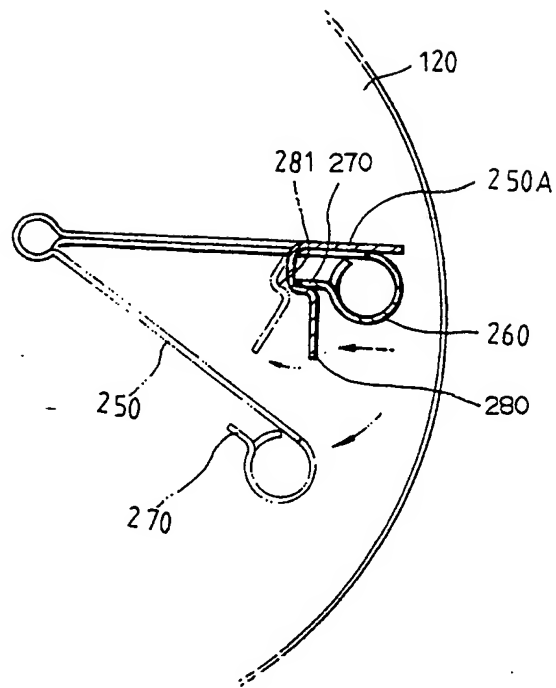
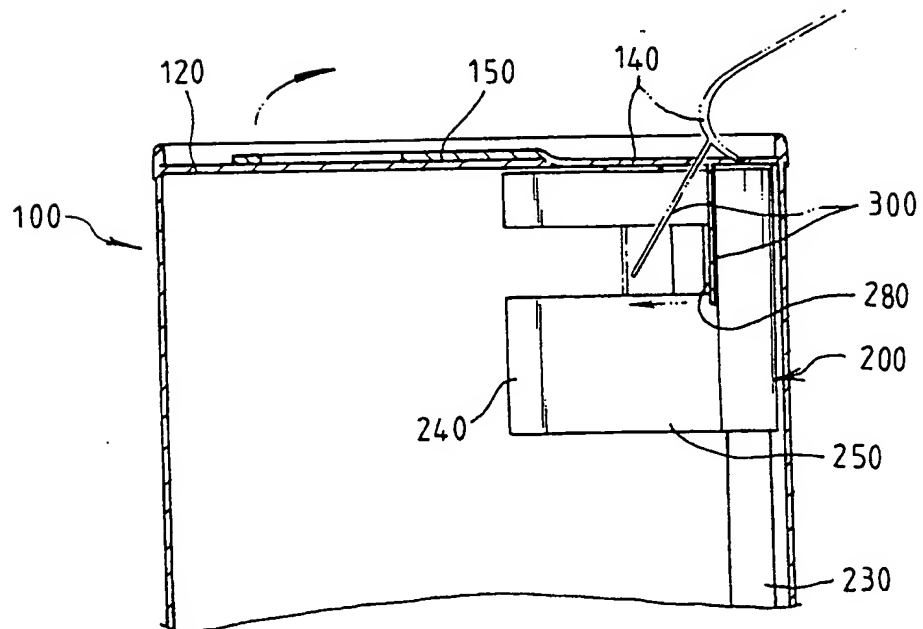


FIG. 10



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR 98/00154

## A. CLASSIFICATION OF SUBJECT MATTER

IPC<sup>6</sup>: B 65 D 25/10; A 47 G 21/18

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC<sup>6</sup>: B 65 D; A 47 G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 537 324 A (WANG) 27 August 1985 (27.08.85), fig.1-11.	1,2
A	US 5 054 639 A (AHN) 08 October 1991 (08.10.91), fig.1-18.	1-9
A	US 4 930 652 A (MURPHY et al.) 05 June 1990 (05.06.90), fig.1-7.	1-9
A	US 5 080 247 A (MURPHY et al.) 14 January 1992 (14.01.92), fig.1-10.	1-9
A	US 5 244 112 A (MURPHY et al.) 14 September 1993 (14.09.93), fig.1-11.	1-9
	----	

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

25 September 1998 (25.09.98)

Date of mailing of the international search report

08 October 1998 (08.10.98)

Name and mailing address of the ISA/AT

Austrian Patent Office

Kohlmarkt 8-10; A-1014 Vienna

Facsimile No. 1/53424/535

Authorized officer

Werner

Telephone No. 1/53424/357

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 98/00154

In Recherchenbericht angeführtes Patentedokument Patent document cited in search report Document de brevet cité dans le rapport de recherche		Datum der Veröffentlichung Publication date Date de publication	Mitglied(er) der Patentfamilie Patent family member(s) Membre(s) de la famille de brevets	Datum der Veröffentlichung Publication date Date de publication
US A	4537324	27-08-85	keine - none - rien	
US A	5054639	08-10-91	keine - none - rien	
US A	4930652	05-06-90	AT E 133914 AU A1 56421/90 BR A 9006756 CA AA 2031525 DE CO 69025261 DE T2 69025261 DK T3 424507 EP A1 424507 EP A4 424507 EP B1 424507 ES T3 2085906 JP T2 4500495 WO A1 9013491 US A 5080247 US A 5244112	15-02-96 29-11-90 06-08-91 04-11-90 21-03-96 05-09-96 28-03-96 02-05-91 24-07-91 07-02-96 16-06-96 30-01-93 15-11-90 14-01-92 14-09-93
US A	5080247	14-01-92	AT E 133914 AU A1 56421/90 BR A 9006756 CA AA 2031525 DE CO 69025261 DE T2 69025261 DK T3 424507 EP A1 424507 EP A4 424507 EP B1 424507 ES T3 2085906 JP T2 4500495 US A 4930652 WO A1 9013491 US A 5244112	15-02-96 29-11-90 06-08-91 04-11-90 21-03-96 05-09-96 28-03-96 02-05-91 24-07-91 07-02-96 16-06-96 30-01-93 05-06-90 15-11-90 14-09-93
US A	5244112	14-09-93	AT E 133914 AU A1 56421/90 BR A 9006756 CA AA 2031525 DE CO 69025261 DE T2 69025261 DK T3 424507 EP A1 424507 EP A4 424507 EP B1 424507 ES T3 2085906 JP T2 4500495 US A 4930652 WO A1 9013491 US A 5080247	15-02-96 29-11-90 06-08-91 04-11-90 21-03-96 05-09-96 28-03-96 02-05-91 24-07-91 07-02-96 16-06-96 30-01-93 05-06-90 15-11-90 14-01-92